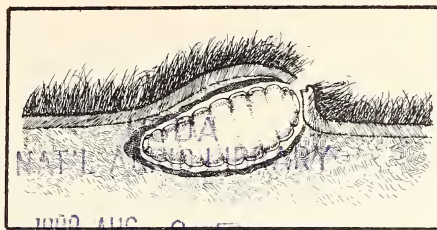


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HOW TO CONTROL CATTLE GRUBS

How To Control Cattle Grubs

Prepared by Entomology Research Division,

Agricultural Research Service

Two kinds of cattle grubs are found in the United States.

The common cattle grub¹ occurs in all States except Alaska. The northern cattle grub² is abundant in Canada and the Northern United States, and occurs as far south as an imaginary line through southern California and the northern parts of Arizona, Oklahoma, Tennessee, and South Carolina.

Except for an infestation first reported in Chile in 1959, cattle grubs are confined to the Northern Hemisphere.

LIFE CYCLE

The adult insects (heel flies) lay their eggs on the heels, legs, and other parts of the body of cattle. The eggs hatch into larvae (grubs) in 3 or 4 days.

Soon after hatching, the young grubs burrow into the skin and slowly work their way through the animal's body until they reach the

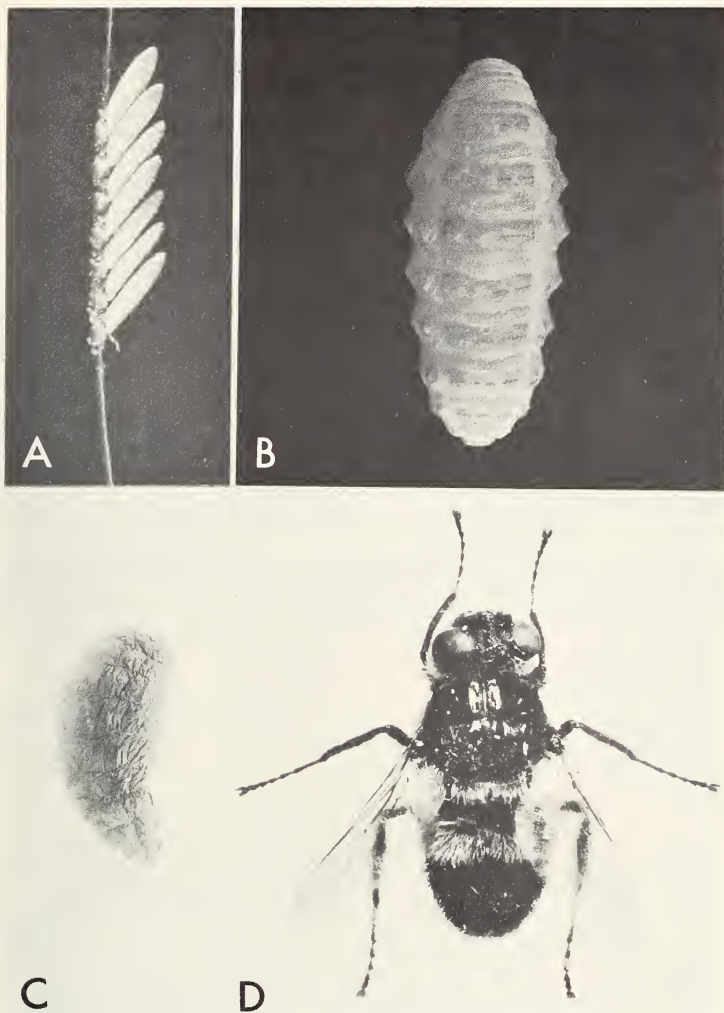
gullet (common cattle grub) or spinal canal (northern cattle grub). The grubs remain in the gullet or spinal canal several months before starting another migration, this time to the muscles in the animal's back.

When the grubs reach the animal's back, they settle just beneath the hide and cut breathing holes through it. At this time, you may notice swellings, often called warbles or wolves, forming beneath the hide. The grubs remain in the animal's back about 6 weeks. During this period, they gradually enlarge their breathing holes.

When full grown, the spiny grubs work their way out through the breathing holes and drop to the ground, where they change to pupae. Three to ten weeks later, the time depending upon the temperature, the adult heel flies emerge from the pupal cases and are ready for mating and egg laying. The entire life cycle takes about a year, 8 to 11 months of which are spent as grubs in the bodies of cattle.

¹ *Hypoderma lineatum*.

² *H. bovis*.



M&A 6985, M&A 9165

Common cattle grub: A, eggs; B, larva; C, pupa; D, adult.

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LOSSES

Cattle grubs probably cause greater losses than any other pest of cattle. Besides damaging meat and hides by their burrowing, they lower beef cattle gains and milk production of dairy cattle throughout the year. Beef cattle producers and dairymen often fail to notice the hidden toll these insects take, but profit losses are estimated at \$200 million to \$400 million each year.

The losses begin when heel flies lay their eggs on the cattle. The heel flies cause no pain to cattle, but they frighten the animals and make them difficult to manage. When attacked, cattle run about wildly with their tails in the air, and are often injured in this wild stampeding.

Cattle find some relief from heel flies by standing for hours in deep shade or water. Failure to graze during this period causes reduced milk production and subnormal weight gains.

Losses continue during the 8 to 11 months the grubs are in the body of an animal.

At slaughter, some of the meat must be trimmed from expensive cuts and discarded. Tissues underlying the warbles are yellowish and gelatinlike. The butcher calls this "licked beef," a material that must be removed from the carcass. Besides the actual loss of meat, the carcass is downgraded, and brings a lower price. Trim loss on heavily infested carcasses may range from \$5 to \$7.

The usefulness of a grubby, perforated hide for leather is reduced, and its sale value is greatly lowered.

CONTROL

Three systemic insecticides, ronnel, Co-ral, and Ruelene,³ give excellent control of grubs in beef cattle. Control in dairy cattle is more difficult because these systemics can only be used on nonlactating dairy animals within a specified time before freshening.

The insecticides are called systemics because they are distributed inside the body of the animal. The circulatory system carries the insecticide to the site where the grubs occur.

Control in Beef Cattle

The three systemic insecticides are equally effective in controlling grubs in beef cattle, but they differ in their means of application.

The proper timing of systemic insecticide application is important. Only one application is necessary, but it should be made as soon as possible after all heel fly activity has stopped. Early applications are safer and more effective than later ones. Treatment time ranges from late spring to fall in southern States, and from early summer to late fall in northern States. For more detailed information on exact timing in your locality, consult your county agent or State extension entomologist.

Ronnel.—Cattle grub treatments with ronnel are made by feeding the insecticide to the animals. Purchase a product containing a purified grade of the insecticide specifically labeled for such use.

³ Trade names are used in this publication solely for the purpose of providing specific information. Mention of trade names does not constitute a guarantee or warranty of the products named.



M&A 14138

The backs of these animals have been clipped. *Above:* Grub-infested cattle were untreated. *Below:* Grub-free cattle were treated with a systemic insecticide.

One registered ronnel product should be mixed with feed to make a feed mixture containing 0.26 percent of ronnel. This mixture should be fed at the rate of 0.3 pound daily per 100 pounds of body weight of the cow for 14 consecutive days.

Other ronnel products may be purchased already mixed with feed and minerals. One such feed mixture contains 0.6 percent of ronnel and should be fed at the rate of 0.3 pound daily per 100 pounds of body weight of the cow for 7 consecutive days.

Instructions printed on the labels of these ronnel products must be followed carefully in mixing, and also in feeding.

Ronnel feed mixtures and feed supplements should be offered in covered feeders. Locate the feeders where the cattle will easily find and eat the treated feed.

Make certain adequate feeding space is available so each animal can get its share. Provide 1 feeder per 15 to 20 head of cattle. If the cattle do not eat the desired amounts, add some palatable feed, such as soybean meal, to the treated feed. Feed this for a few days, then return to the regular ronnel-treated feed mixture for the remainder of the feeding period.

Ronnel is also available in a salt block. It contains 5.5 percent of ronnel. The block should be offered continuously for a minimum of 75 days after heel fly activity has stopped. Blocks must be placed where cattle will easily find them, preferably near watering and loafing areas. Provide 1 block per 15 head of cattle. Do not feed salt in any other way while cattle are supplied with the blocks. Do not allow the cattle to run out of treated blocks.

Do not use a ronnel feed additive and a ronnel mineral supplement at the same time.

Ronnel treatments must be completed 21, 28, or 60 days before slaughter so none of the insecticide will be present in the meat or fat at slaughter. The waiting period between the last treatment and slaughter depends on the formulation used—see label.

Co-ral.—You can use Co-ral (coumaphos) as a spray, dip, or pour-on treatment. Purchase the wettable-powder formulation and dilute according to label directions, or purchase the pour-on solution.

For spraying, apply either a 0.375-percent⁴ or 0.25-percent concentration. If a 0.25-percent spray is used, make two applications not more than 90 days apart. Apply the 0.375-percent⁴ spray or the second 0.25-percent spray soon after heel fly activity has stopped. Apply a light spray to animals 3 to 6 months old. Spray older animals until the entire body is wet to the skin. For a dip treatment, use a 0.25-percent concentration.

In using a pour-on treatment, follow the manufacturer's instructions on the product label.

Do not treat animals less than 3 months old. Do not treat animals with Co-ral for 10 days before or after shipping or weaning, or after exposure to contagious diseases. Do not apply in conjunction with oral drenches or other internal medications, such as phenothiazine, nor with pyrethrins, alle-

⁴A spray containing 0.5 percent of Co-ral may be used in northern areas or for late fall applications when long coats make thorough wetting of the skin difficult.



BN-20509

Pour-on treatment for cattle grub control.

thrin, or synergist. Do not dip overheated animals.

Ruelene.—You can apply Ruelene as a spray or pour-on treatment. Purchase an emulsifiable liquid and dilute it according to label directions. For the spray treatment, apply a 0.5-percent concentration and wet the animal's entire body to the skin.

For the pour-on treatment, make an 8.3-percent concentration by mixing the Ruelene with water; or purchase a pour-on formulation. Apply 1 ounce of Ruelene pour-on per 100 pounds of body weight, but apply no more than 8 ounces per animal. Pour the mixture evenly along the backline of the animal.

Spray and pour-on treatments with Ruelene must be completed at least 28 days before slaughter.

Do not apply Ruelene as a pour-on in extremely hot or humid weather; it may irritate the animal's skin.

Control in Dairy Cattle

Systemic Insecticides.—Although systemic insecticides can be used on dairy cattle, they are limited to nonlactating animals. Ruelene may be used on dry dairy animals, but it should not be applied within 28 days of freshening. Co-ral must not be used within 14 days, and ronnel within 21, 28, or 60 days, of freshening. The waiting period depends on the formulation used—see label.

Rotenone.—For most dairy cattle, rotenone or derris must be used. A high-pressure sprayer gives the best results when a large number of cattle are being treated.

Purchase a 5-percent wettable powder. Mix $7\frac{1}{2}$ pounds in 100 gallons of water. Spray animals until the entire body is wet to the skin. Make two or three applications at 30-day intervals. Make the initial application about 30 days after the first warbles appear.

A dry derris dust containing 1.5 percent of rotenone may be rubbed into the grub holes. A wash treatment can be prepared by mixing 12 ounces of a 5-percent rotenone wettable powder in 1 gallon of water. Use a sponge or brush to apply about 1 pint of the mixture per animal. Both of these methods are inefficient when a large number of cattle are to be treated.

PRECAUTIONS

Insecticides are poisons. Handle them with care. The instructions and precautions on the labels of pesticides sold in interstate commerce have been reviewed by the Department of Agriculture. These instructions should be followed exactly. Observe all precautions. Also, observe all the precautions included in discussions of ronnel, Co-ral, and Ruelene in this publication.

Do not overdose. Do not use more than one systemic insecticide. For example, if you use one systemic as a feed additive, do not apply another as a spray, dip, or pour-on.

Do not apply an insecticide to an animal that is sick, weak, or stressed.

Store insecticides out of reach of children and pets. Destroy insecticide containers as soon as they are empty. Do not contaminate streams, lakes, or water supplies.

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